12.

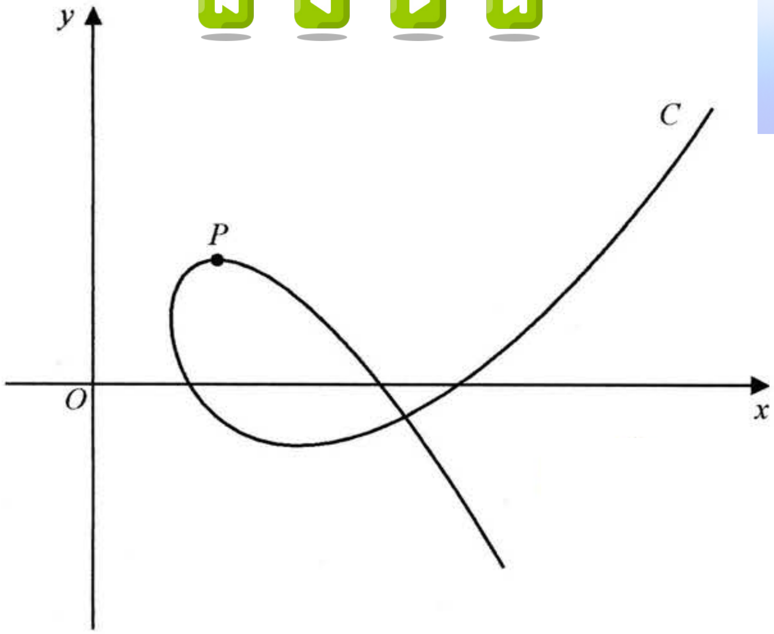

Figure 3

Figure 3 shows a sketch of the curve C with parametric equations

$$x = t^2 + t + 4 \qquad y = t^3 - 12t + 5 \qquad -5 \leqslant t \leqslant 5$$

(a) Find $\dfrac{dy}{dx}$ in terms of t.

(2)

Given that the point P lies on C such that the tangent to C at P is parallel to the x-axis,

(b) find the coordinates of P.

(2)

Given that this tangent meets C again at the point Q,

(c) find, using algebra, the coordinates of Q.

(3)